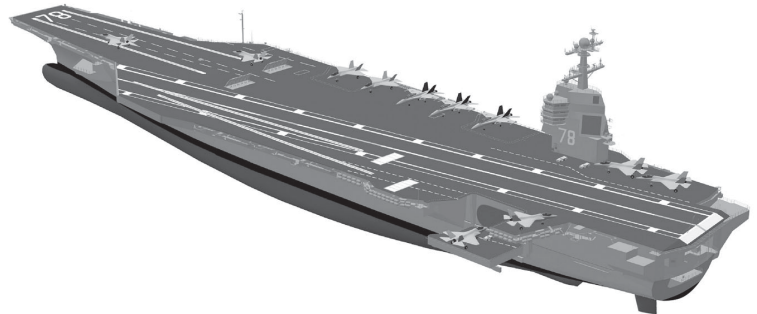


NAVY PROGRAMS

CVN 21 Program Next Generation Aircraft Carrier

SUMMARY

- DOT&E approved both the Live Fire Test and Evaluation Management Plan and Test and Evaluation Master Plan this year to support the Milestone B decision.
- An Early Operational Assessment (EOA) report made 51 specific recommendations to the Navy's design process for CVN21.



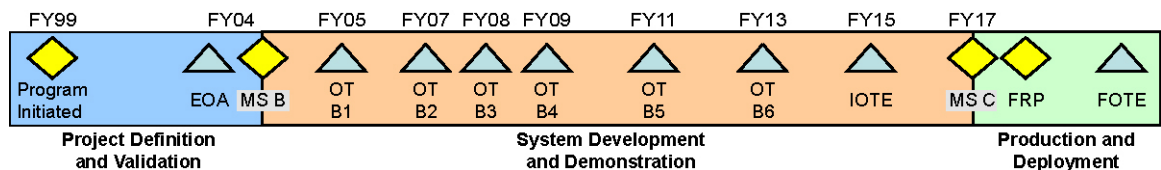
SYSTEM DESCRIPTION AND MISSION

The CVN 21 program (lead ship will be CVN 78) is the planned successor for the NIMITZ-class carriers (CVN 68). It is a single step development program maintaining the same hull form as the NIMITZ-class, but introduces several advanced technologies to increase sortie generation rate, survivability, and interoperability and to decrease manpower requirements. The Navy is designing the ship in two phases. Phase I covers the hull, mechanical, flight deck, island and radars. Phase II includes the integrated warfare system (expected to leverage extensively from DDX), and the aviation intermediate maintenance facilities. The Navy is purposefully delaying decisions on, and insertion of, Phase II equipment to provide the most advanced technology and minimize disruptive changes during ship construction.

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The ship will incorporate a new nuclear propulsion plant designed to reduce reactor department manning by 50 percent and to have significantly more electric generating capacity than the present NIMITZ class plant. Hull materials and internal design features emphasize enhanced survivability. CVN 21 will have a smaller island set further back on the flight deck, featuring slightly modified DDX Dual Band Radar. The ship will have three (rather than four) aircraft elevators, two (rather than three) hangar bays, and electromagnetic (rather than steam) catapults arranged in an unobstructed configuration. It will have a redesigned advanced arresting gear and redesigned weapons stowage, as well as weapons elevators. These improvements/rearrangements, plus a slightly larger flight deck and a pit-stop (single location) fueling/arming setup, are projected to achieve a significant increase in sortie generation rate.

TEST AND EVALUATION ACTIVITY



The Navy's Operational Test and Evaluation Force conducted an EOA, OT-A, from October 30, 2003, to February 29, 2004, in support of an April 2004 Milestone B. Subject matter experts drawn from staffs, ships, Navy and joint test organizations, as well as DOT&E, reviewed ten focus areas. The subject matter experts reviewed preliminary designs, technology readiness assessments, diagrams, models, simulations, 2D visualizations, and the Electromagnetic Aircraft Launch System pre-down select demonstration units. The Navy completed their report March 19, 2004. To provide insight into future operations, the Navy plans to conduct several OT-B assessments during ship construction.

NAVY PROGRAMS

The Navy conducted six tests this year on the ex-USS *Shadwell* fire safety research and test facility. One test series replicated simulated aircraft fires in the hangar bay caused by threat weapon attack. In another test series, the Navy evaluated the current aircraft carrier magazine sprinkler system performance against in-space and adjacent space fires. The current detection system was inadequate for detecting fires prior to the build-up of potentially hazardous conditions. In addition to the above tests, the Navy conducted a scaled underwater explosion-type test this year at the Aberdeen Test Center, Maryland, to provide data to verify computer models used in vulnerability assessments and design efforts.

DOT&E approved both the LFT&E Management Plan and the Test and Evaluation Master Plan in March 2004 to support the Milestone B decision. The Under Secretary of Defense, Acquisition, Technology, and Logistics sent the LFT&E waiver for full-up system level testing to Congress in April.

TEST AND EVALUATION ASSESSMENT

The approved LFT&E program will be a comprehensive evaluation based on CVN survivability studies, lessons learned from battle damage and flight deck accidents, relevant weapon effects tests, probability of kill versus probability of hit studies, damage scenario-based engineering analyses of specific hits, vulnerability assessment reports, a total ship survivability trial, a ship shock trial, and extensive surrogate testing.

The EOA resolved no Critical Operational Issues due to system immaturity. The EOA study team assessed the design as unable to meet two Key Performance Parameters:

- Weight service life allowance.
- Sortie generation rate, to include intelligence support capability.

These two issues prompted the scheduling of a special interest Defense Acquisition Board Program Review no later than 2QFY05. The ship design team intends to resolve the weight service life allowance Key Performance Parameter during the ship design process. The sortie generation rate threshold requirements are 160 sorties per day sustained (30 days of normal operations) and 270 sorties per day surge (four days of continuous operations). The sortie generation rate model, as run during the EOA, yielded a sustained sortie generation rate of 155 per day and a surge sortie generation rate of 237. The Navy intends to re-address the assumptions and operational concepts underpinning the sortie generation rate model in preparation for the next operational assessment.

The EOA report made 51 specific recommendations to the design process. The CVN 21 program office and the contractor's design team are reviewing those recommendations for incorporation. Several recommendations deal with subsystems being developed by Participating Acquisition Resource Managers and are not under the direct purview of the CVN 21 program office and do not consider CVN 21 as a threshold platform. DOT&E believes that reducing program risk in these Participating Acquisition Resource Manager areas is critical for success and concurs with the increased focus on this issue by the CVN 21 program office during the next two years of ship design.

Two specific EOA recommendations, while not specific Operational Requirements Document requirements, are examples of the range of design considerations put forth in the EOA and under consideration by the Navy. The current design does not place forced ventilation in crew sanitary spaces. While not explicitly required in the Operational Requirements Document, the Navy shipboard habitability standard states the requirement and the EOA recommends its incorporation. The other recommendation draws attention to maintenance requirements for the MV-22. This aircraft requires more vertical clearance in the hangar deck than provided for in the current design. Although the MV-22 is not currently forecast as a member of the Navy's carrier air wing, it is a potential replacement for the current Carrier Onboard Delivery aircraft, is carrier capable, and will be in the Marine Corps inventory. The EOA recommends designing in vertical clearance in the hangar bay for the MV-22.